## II. Amendments to the Claims

Claims 5-15 and 20-36 are pending. Claims 1-4 and 16-19 have been previously cancelled. Claims 5, 7, 8, 11, 12, 20, 22, 26, 27, 29, 30, 31, 35 and 36 are presently amended as set forth below. The remaining claims are set forth below as unchanged. This version and listing of claims replaces all prior versions and listing of claims.

Claims 1-4 (cancelled)

Claim 5 (currently amended) Process according to claims 33 or 34, in which the linear dispersion is introduced into the resonator configuration (3) within the framework of a mode control loop (I) dependent upon the frequency deviation of at least one first reference mode ($M_1$) of the light pulses from a reference frequency ($f_{ref}$), which is

- the output frequency of an optical reference frequency generator (240),
- a higher harmonic or an even number fraction of the output frequency or of the higher harmonic,
- a frequency multiple of a lower frequency reference mode of the light pulses, or a fractional frequency of a higher frequency reference mode of the light pulses.

Claim 6 (original) Process according to Claim 5, whereby in the mode control loop (I) light pulses of the laser device (1) and light with the reference frequency ($f_{ref}$) are superposed and directed to a photosensitive element (211), whose electrical output signal shows a modulation at a beat frequency corresponding to the distance of the frequency of the first reference mode ($M_1$) from the reference frequency ($f_{ref}$), whereby a control (214) is provided, which sets the linear dispersion of the resonator configuration (3) so that the beat signal is minimal or possesses a predetermined beat frequency.

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Claim 7 (currently amended) Process according to Claim 5 ~~or 6~~, whereby the optical reference frequency generator (240) is stabilized in a reference laser control loop (III) in relation to a second higher frequency reference mode ($M_2$) of the light pulses.

Claim 8 (currently amended) Process according to Claim 6 ~~one of the Claims 5 through 7~~, whereby the optical reference frequency generator (240) is a stabilized continuous wave laser.

Claim 9 (previously amended) Process according to claim 33 or claim 34, whereby the linear dispersion is introduced into the resonator configuration (3) within the framework of a mode control loop (Ia, Ib) depending upon the deviation of the multiplied frequency of a first reference laser (240a), which is phase coupled with a first lower frequency reference mode ($M_1$) of the light pulses, from the frequency of a second reference laser (240b), which is phase coupled in a reference laser control loop (III) with a second higher frequency reference mode ($M_2$) of the light pulses.

Claim 10 (original) Process according to Claim 9, whereby the second reference laser (24Gb) is phase coupled with the second higher frequency reference mode (M2) of the light pulses through a scaling stage

Claim 11 (currently amended) Process according to claim ~~, one of the claims 5 through 10,~~ 33 or 34, whereby the resonator length of the laser device (1) is regulated within the framework of a repetition frequency control loop (II), in which the repetition frequency ($f_r$) of the light pulses is superposed with a radio frequency derived from a radio frequency generator reference (25), whereby a control (224) is provided for, which sets the resonator length of the laser device (1) so that the oscillating signal formed by the superposition is minimal or possesses a predetermined beat frequency.

Claim 12 (currently amended) Process according to~~,~~ claim 33 or claim 34 whereby the linear dispersion is introduced into the resonator configuration (3) within the framework of a



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repetition frequency control loop (II), in which the repetition frequency ($f_r$) of the light pulses is superposed with a radio frequency derived from a radio frequency reference generator (25), whereby a control (224) is provided for, which sets the resonator length of the laser device (1) so that the oscillating signal formed by the superposition is minimal or possesses a predetermined beat frequency.

Claim 13 (original) Process according to Claim 12, whereby the resonator length of the laser device (1) is regulated within the framework of a mode control loop (I) dependent upon the frequency deviation of at least a first reference mode ($M_1$) of the light pulses from a reference frequency ($f_{ref}$), which is the output frequency of an optical reference frequency generator (24) or a higher harmonic or an even number fraction of the output frequency or the higher harmonic.

Claim 14 (original) Process according to Claim 12, whereby the resonator length of the laser device (1) is regulated within the framework of a mode control loop (I) dependent upon the frequency deviation of at least a first reference mode ($M_1$) of the light pulses from a reference frequency ($f_{ref}$), which is the output frequency of an optical reference frequency generator (24) or a higher harmonic or an even number fraction of the output frequency or the higher harmonic.

Claim 15 (original) Process according to Claim 12, whereby the resonator length of the laser device (1) is regulated within the framework of a mode control loop (I) dependent upon the frequency deviation of at least a first reference mode ($M_1$) of the light pulses from a reference frequency ($f_{ref}$), which is the output frequency of an optical reference frequency generator (24) or a higher harmonic or an even number fraction of the output frequency or the higher harmonic.

Claims 16-19 (cancelled)

Claim 20 (currently amended) Laser device according to Claim 35 or 36, which is constructed as a ring laser.

Claim 21 (previously amended) Laser device according to claim 20, whereby a resonator length setting device (5) is provided for the change of the resonator length through a change in positioning of one of the tilted mirrors (33b).

Claim 22 (currently amended) Laser device according to ~~,~~ claims 35, 36 or 21 whereby a mode control loop (I, 210, 214) is provided for the regulation of the dispersion setting device (7, 8, 8') or the regulation of the resonator length setting device (5), dependent upon the frequency deviation of at least one frequency component of the light pulses from a reference frequency ($f_{ref}$), which is the output frequency of an optical reference frequency generator (240) or a higher harmonic or an even number fraction of the output frequency or of the higher harmonic or a multiplied frequency of a lower frequency reference mode or a divided frequency of a higher frequency reference mode of the light pulses.

Claim 23 (original) Laser device according to Claim 22, whereby the mode control loop (I, 210, 214) includes an apparatus (211) for the production of a beat signal from the frequency component of the light pulses and the reference frequency ($f_{ref}$) and a mode control (214) for the dispersion setting device (7) or the resonator length setting device (5), so that the dispersion setting device (7) or the resonator length setting device (5) is activated in such a way that the beat signal is either minimal or possesses a predetermined beat frequency.

Claim 24 (original) Laser device according to Claim 22, whereby the mode control loop (I, 210, 214) includes an apparatus (211) for the production of a beat signal from the frequency component of the light pulses and the reference frequency ($f_{ref}$) and a mode control (214) for the dispersion setting device (7) or the resonator length setting device (5), so that the dispersion setting device (7) or the resonator length setting device (5) is activated in such a way that the beat signal is either minimal or possesses a predetermined beat frequency.

Claim 25 (original) Laser device according to Claim 24, whereby a filter element (212) for spectral selective detection of the light pulses is provided at the photosensitive element.

Claim 26 (currently amended) Laser device according to ~~,~~ claim 35, claim 36 or claim 21 whereby a mode control loop (I, 210, 214) is provided for the regulation of the dispersion setting device (7, 8, 8') or the regulation of the resonator length setting device (5), dependent upon the frequency deviation of the frequency of a first reference laser (240a), which is phase coupled with a first lower frequency reference mode ($M_1$ ) of the light pulses, from the frequency of a second reference laser (240b), which is phase coupled with a second ($M_2$) higher frequency reference mode of the light pulses.

Claim 27 (currently amended) Laser device according to ~~,~~ claim 35 or ~~, claim~~ 36 ~~or claim 26~~ whereby a repetition frequency control loop (II, 220, 224) is provided for the regulation of the resonator length setting device (5) or the dispersion setting device (7, 8, 8'), dependent upon the frequency deviation of at least one differential frequency between the repetition frequency of the light pulses and a radio frequency.

Claim 28 (original) Laser device according to Claim 27, whereby a radio frequency reference generator (25) is provided for the generation of the reference radio frequency and the repetition frequency control loop comprises a device for the generation of a beat signal from the signal of a photosensitive element (221) that captures the light pulses, and from the signal of a radio frequency reference generator (250), and a reference frequency control (224) for the resonator length setting device (5) or the dispersion setting device (7, 8, 8'), whereby the repetition frequency control (224) is structured so that the resonator length setting device or the dispersion setting device (7, 8, 8') is operated so that the second oscillating signal is minimal or possesses a predetermined beat frequency.

Claim 29 (currently amended) Laser device according to Claim 22 ~~one of the Claims 21 through 28~~, whereby further a reference laser control loop (III, 231) is provided for the

regulation of the optical reference frequency generator or reference laser (240), with a device (231) for the generation of a beat signal from a higher frequency component of the light pulses or a part of this frequency component and a frequency equal to a multiple of the reference frequency ($f_{ref}$), and a setting device for the setting of the optical reference frequency generator or reference laser (240) so that the beat signal is minimal or has a predetermined beat frequency.

Claim 30 (currently amended) Laser device according to Claim 35 or 36, ~~one of the Claims , 20 through 29, 35 and 36,~~ whereby the active medium (4) includes a solid or a dye medium.

Claim 31 (currently amended) Laser device according to Claim 35 or 36, ~~one of the Claims , 20 through 30, 35 and 36~~ whereby a device (201) is provided for self phase modulation.

Claim 32 (previously amended) Application of a process or a laser device according to claim 34 for the measurement of optical frequencies of frequency differential, generation of optical frequencies, bridging of large frequency differences in optical division chains, generation of optical transmitting frequencies in telecommunications technology, spectroscopic measurement of atomic electronic transitions, or the bridging of the frequency of an optical frequency normal to a measuring frequency that may be counted with electronic means.

Claim 33 (previously added) Process for the operation of a laser device having a resonator configuration with a light path, comprising the steps of:

producing light pulses circulating in the resonator configuration, said light pulses consisting of a spectral components corresponding to multiple longitudinal modes of the resonator configuration;

subjecting said light pulses to a compensation of the group velocity dispersion; and

introducing a predetermined linear dispersion into the light path of the resonator configuration, so that at least one mode possesses a predetermined frequency or the mode separation between the modes possesses a predetermined value;

said step of introducing a predetermined linear dispersion comprising at least one of a tilting of a transparent plane, a pushing in of a pair of prisms in the light path of the resonator configuration, a setting of the effective pumping power for the pumping of the active medium of the laser device, or a change of the geometric configuration of the laser device relative to a pump laser.

Claim 34. (previously added) Process for the operation of a laser device having a resonator configuration with a light path, comprising the steps of:

producing light pulses circulating in the resonator configuration, said light pulses consisting of a spectral components corresponding to the multiple longitudinal modes of the resonator configuration;

subjecting said light pulses to a compensation of the group velocity dispersion, and

introducing a predetermined linear dispersion into the light path of the resonator configuration, so that at least one mode possesses a predetermined frequency or the mode separation between the modes possesses a predetermined value;

said step of introducing a predetermined linear dispersion comprising a changing a spectrally specific effective resonator length in a resonator branch, through which the light pulses traverse spectrally spatially separated after the compensation of the group velocity dispersion.

Claim 35. (currently amended) Laser device for the production of short light pulses, having a resonator configuration with

an active medium;

a plurality of resonator mirrors with an incoupling mirror for the coupling in of pump light to the active medium, an outcoupling mirror for the output of light pulses and several tilted mirrors;

a compensating mechanism for the compensation of the group velocity dispersion of the light pulses;

a dispersion setting device for the introduction of a predetermined linear dispersion into the light path of the resonator configuration; and

said dispersion setting device comprising at least one of a transparent plate with a tilting mechanism, a pair of prisms with a sliding mechanism, which are included in the resonator configuration, an apparatus for the variation of the effective pump power of the pump laser, or an apparatus for the variation of the geometrical configuration of the laser device relative to a pump laser.

Claim 36. (previously added) Laser device for the production of short light pulses, having a resonator configuration with

an active medium;

a plurality of resonator mirrors with an incoupling mirror for the coupling in of pump light to the active medium, an outcoupling mirror for the output of light pulses and several tilted mirrors;

a compensating mechanism for the compensation of the group velocity dispersion of the light pulses;~~and~~

a dispersion setting device for the introduction of a predetermined linear dispersion into the light path of the resonator configuration; and

said dispersion setting device comprising a pivoting mechanism on a tilted mirror functioning as a resonator end mirror and being located in a branch of the resonator on the side of the compensating mechanism facing away from the active medium.